

We claim:

1. A method for evaluating *in vivo* a test substance for growth of new vascular tissue, comprising the steps of:
 - a. providing a rodent pup having a pupillary membrane system in a first eye;
 - b. injecting transcorneally a test substance proximate to the pupillary membrane; and
 - c. examining the pupillary membrane to determine whether new vascular tissue has grown.
2. The method according to claim 1 further comprising a step of comparing the new examined tissue growth with that of a control., preferably the pupillary membrane of the other eye.
3. The method according to claim 1 wherein the examination is by a computer analysis of at least one image of the pupillary membrane system.
4. A method for evaluating *in vivo* a test substance for inhibiting or preventing the growth of new vascular tissue, comprising the steps of:
 - a. providing a rodent pup having a pupillary membrane system in a first eye;
 - b. injecting transcorneally proximate to the pupillary membrane a first composition comprising a first substance that can induce new vascular tissue growth;
 - c. injecting transcorneally proximate to the pupillary membrane a second composition comprising an angiogenic regressor test substance; and
 - d. examining the pupillary membrane to determine whether new vascular tissue has grown.
5. The method according to claim 4 wherein the first composition and the second composition are injected simultaneously.
6. The method according to claim 5 further comprising a step of comparing the new examined tissue growth with that of a control.

7. A method for evaluating *in vivo* the effect on a property of a capillary vessel structure by a small molecule test substance, comprising the steps of:
 - a. providing a rodent pup having a pupillary membrane system in a first eye;
 - b. injecting transcorneally proximate to the pupillary membrane a first composition comprising a small molecule test substance, preferably selected from the group consisting of a chemical element, a chemical compound, a low molecular weight carbohydrate, a peptide, and mixtures thereof; and
 - c. examining the pupillary membrane to determine the effect of the small molecule test substance on the property of the capillary vessel structure of the pupillary membrane.
8. The method according to claim 7 wherein the property is the elasticity of the capillary vessels or the vascular permeability.
9. A method for evaluating *in vivo* the effect of a test substance on a problematic vascular condition comprising the steps of:
 - a. providing a rodent pup having a pupillary membrane system in a first eye;
 - b. inducing a problematic vascular condition into one or more capillary vessels of the pupillary membrane;
 - c. injecting transcorneally proximate to the pupillary membrane a first composition comprising a test substance; and
 - d. examining the pupillary membrane to determine the effect of the test compound on the problematic capillary vessel condition.
10. A method for the treatment of a persistent pupillary membrane in a mammal, comprising the steps of:
 - a. providing a mammal with an eye having a persistent pupillary membrane; and
 - b. injecting transcorneally proximate to the persistent pupillary membrane an effective amount of an anti-angiogenic substance, whereby the persistent pupillary membrane is reduced or eliminated.